REMARKS

This application has been carefully reviewed in light of the Office Action dated December 8, 2009. Claims 1, 2, 4-6, 9-11 and 14 remain in this application. Claims 1 and 2 are the independent Claims. Claims 1, 2, 6, 10, 11 and 14 have been amended. Claims 3, 7, 8, 12, 13 and 15-20 have been cancelled, without prejudice.

It is believed that no new matter is involved in the amendments or arguments presented herein.

Reconsideration and entrance of the amendment in the application are respectfully requested.

Objection to the Title of the Invention

The Title of the Invention was objected to for an informality. In response, Applicant has amended the Title to address the informality.

Reconsideration and withdrawal of the above objection are respectfully requested.

Claim Objections:

Claims 10-11, and 14 were objected to under 37 CFR. 1.75(c) as being in improper form.

In response, Applicant has amended the claims to overcome the objection.

Reconsideration and withdrawal of the above objection are respectfully requested.

Art Based Rejections:

Claims 1, 3-4, 6 and 9 were rejected under 35 U.S.C. 103 (a) over US 2002/0132898 (Takaya '898) and in view of EP1262450 (Takaya '450) with supporting evidence provided by U.S. Patent No. 4,803,591 (Miyashita); Claims 1, 3-4, 9-12 and 14 were rejected under 103(a) over Takaya '898 in view of Takaya '450; Claims 2-4, 6 and 9 were rejected under 103(a) over Takaya '898 in view of Takaya '450, with supporting evidence provided by Miyashita; Claims 5 and 7-8 were rejected under 103(a) over Takaya '898 in view of Takaya '450, with supporting evidence provided by Miyashita and further in view of U.S. Patent No. 5,650,368 (Tateishi).

Applicant respectfully traverses the rejections and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Claims are Patentable Over the Applied References

The present application is generally directed to a composite dielectric material.

As defined by amended independent Claim 1, a composite dielectric material includes a resin material and an approximately spherical dielectric ceramic powder to be mixed with the resin material. The composite dielectric material is characterized in that the dielectric ceramic powder is based on BaO-R_2O_3-TiO_2. The dielectric ceramic powder includes an oxide of a transition metal element having at least two states of ionic valences less than 4. The dielectric ceramic powder has a specific surface area of 1.2 m^2/g or less and exclusive of 0. The content of the dielectric ceramic powder is 40 vol% or more and 70 vol% or less when the total content of the resin material and the dielectric ceramic powder is represented as 100 vol%. The electric resistivity of the composite dielectric material is 1.0×10^{12} Ω·cm or more, wherein R is a rare earth element and R_2O_3 is an oxide of the rare earth element. The dielectric ceramic powder includes a Mn oxide as the oxide of a transition metal element having at least two

states of ionic valences less than 4 and the content of the Mn oxide in the composite dielectric material is 0.01 to 0.1 wt% in terms of MnO, and the dielectric constant ε of the composite dielectric material is 10 or more wherein the measurement frequency therefore is 2 GHz.

The applied references fail to disclose the above features of amended independent Claim 1 of the present invention. In particular, the applied references fail to disclose, teach or even suggest "said dielectric ceramic powder has a specific surface area of 1.2 m^2/g or less and exclusive of 0," as required by amended independent Claim 1 of the present invention.

Moreover, the applied references fail to disclose or suggest "the electric resistivity of said composite dielectric material is 1.0×10^{12} Ω·cm or more," as required by amended independent Claim 1 of the present invention.

Moreover, the applied references fail to teach or suggest "said dielectric ceramic powder comprises a Mn oxide as said oxide of a transition metal element having at least two states of ionic valences less than 4," as required by amended independent Claim 1 of the present invention.

Furthermore, the applied references fail to disclose "and the content of said Mn oxide in said composite dielectric material is 0.01 to 0.1 wt% in terms of MnO, and the dielectric constant ε of said composite dielectric material is 10 or more wherein the measurement frequency therefore is 2 GHz," as required by amended independent Claim 1 of the present invention.

By way of explanation, the present specification specifically states that "If the specific surface area of the dielectric ceramic powder is made to be as small as 1.2 m^2/g or less (exclusive of 0) when producing the composite dielectric material, the electric resistivity is decreased, (*See, Specification, pp. 8-9*), and that the "dielectric ceramic powder contain at least one oxide selected from a Mn oxide, a Cr oxide, a Fe oxide, a Co oxide, a Ni oxide and a Cu oxide, the decrease of the electric resistivity can be suppressed even when the specific surface area of the dielectric ceramic powder is small." (*See, id.*)

As one of ordinary skill in the art would readily appreciate, Takaya '898 fails to disclose or suggest such a relationship among a specific surface area of a dielectric ceramic powder, an oxide of a transition metal element having at least two states of ionic valences less than 4, such as a Mn oxide, and an electric resistivity of a composite dielectric material, as recited in amended independent Claim 1 of the present invention.

Takaya '450 discloses "The mean particle size of the particles consisting of the powder thus obtained was ***2.5 μm***, and the shape of the fine particles were extremely **close to a perfect shape**." (*See, Takaya, Example 2; [0084]*). One of ordinary skill in the art would thus understand that, per, e.g., *Miyashati, Col.3, ll. 1-11,* the powder obtained in Example 2 of Takaya '450 has a specific surface area of **2.4 m^2/g**, which falls outside of the upper limit recited in amended independent Claim 1 of the present invention.

Moreover, one of ordinary skill in the art would realize that Takaya '450 fails to disclose, teach or even suggest the recited features of amended independent Claim 1 requiring that "the dielectric constant ε of said composite dielectric material is 10 or more wherein the measurement frequency therefore is 2 GHz." (See, Takaya '450, Example 5, Table 2.), or "an electric resistivity of the composite dielectric material that is 1.0×10^{12} Ω·cm or more," as required by amended independent Claim 1.

The Office Action contends that the Sample 301 of Takaya '898 negates the inventiveness of the present invention. Applicant respectfully traverses this contention. As one of ordinary skill would readily recognize, Sample 301 of Takaya '898 has no Mn oxide, thus it cannot attain the electric resistivity of the composite dielectric material required by amended independent Claim 1 of the present invention.

Moreover, Takaya '898 fails to disclose or suggest the recited features of amended independent Claim 1 regarding a relationship among a specific surface area of a dielectric ceramic powder, a Mn oxide, and an electric resistivity of a

composite dielectric material, or that the dielectric ceramic powder comprises a Mn oxide of 0.01 to 0.1 wt% in terms of MnO in the composite dielectric material.

The ancillary Tateishi reference does not remedy the above noted deficiencies of the other applied references.

By way of explanation, the present invention has a feature that the dielectric ceramic powder comprises an oxide of a transition metal element having at least two states of ionic valences less than 4 such as a Mn oxide. One of ordinary skill would recognize that the inclusion of the Mn oxide and the like in the dielectric ceramic powder makes it possible to suppress the decrease of the electric resistivity even when the content of the dielectric ceramic powder is 40 vol% or more (*See, Specification, p.10*). In contrast, Tateishi fails to disclose a composite dielectric material comprising a resin material and a dielectric ceramic powder to be mixed with the resin material.

One of ordinary skill would realize that although Tateishi describes the relationship between Mn and Q value, it fails to disclose or suggest the claimed relationship among a specific surface area of a dielectric ceramic powder, a Mn oxide, and an electric resistivity of a composite dielectric material.

Applicant notes that for the purpose of obtaining a high dielectric constant ε in a composite dielectric material, the content of the dielectric material needed is 30 vol% or more. However, in the conventional composite dielectric material (e.g. Japanese Patent Laid-Open No. 2002-158135), when the content of the dielectric material is increased in order to increase the dielectric constant ε, the electric resistivity thereof is decreased (*See, Specification, p.6.*) In contrast, inclusion of the Mn oxide and the like in the dielectric ceramic powder makes it possible to suppress the decrease of the electric resistivity even when the content of the dielectric ceramic powder is 40 vol% or more. That is, according to a composite dielectric material of the present invention, the electric resistivity can be a high value, such as 1.0×10^{12} Ω·cm or more, while satisfactory dielectric properties are being maintained.

One of ordinary skill in the art would realize that although such improvement of the electric resistivity is pronounced when the dielectric ceramic powder has a specific surface area of 1.2 m^2/g or less (exclusive of 0) and that Tateishi fails to disclose, teach or even suggest it.

Advantageously, the present invention has a remarkable effect that the electric resistivity is such a high value as 1.0×10^{12} $\Omega \cdot cm$ or more and the dielectric constant ε is 10 or more (the measurement frequency therefore is 2 GHz) even when the content of the dielectric ceramic powder is 40 vol% or more.

Accordingly, the applied references, alone or in combination, do not disclose, teach or suggest the above features of amended independent Claims1 or 2 of the present invention.

Since the applied references fail to disclose, teach or suggest the above features recited in amended independent Claim 1, these references cannot be said to anticipate or render obvious the invention which is the subject matter of that claim.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Applicant respectfully submits that amended independent Claim 2 is allowable for at least the same reasons as those discussed in connection with amended independent Claim 1 and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from amended independent Claims 1 and 2 recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance.

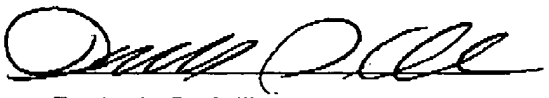
Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 225-2604 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 03-1366.

Respectfully submitted,



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